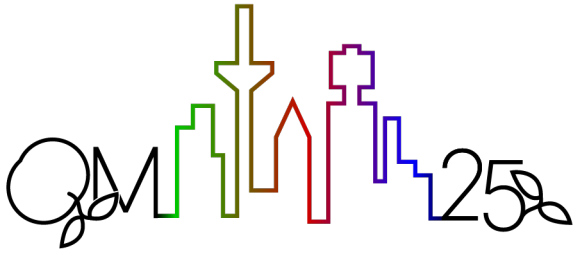

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The Power of the Tsallis-Thermometer as a QGP Indicator For Large And Small Collisional Systems

Recent experimental results present collectivity also in small systems with high-multiplicity. Today these phenomena are not completely understood: it is an important question whether the presence of the QGP is necessary for the observed collectivity or not. Moreover, the connection between the experimental observables and theories is not trivial. In our phenomenological study we introduce the 'Tsallis-thermometer'as an indicator of quark-gluon plasma, that aims to describe the smooth transition from small to large collisional systems.

The Tsallis-thermometer is an excellent measure for locating collective effects in high-energy collisions from small to large system sizes. Scaling behaviors are inherited both from the QCD nature and from system size effects. Thermodynamical consistency helps us to measure EoS more accurately.

Successful applications of the Tsallis-thermometer cover the fileds:

(i) analysis of the transverse momentum distribution of identified hadrons within the thermodynamically consistent formulation of non-extensive statistics. A wide range of center-of-mass energies and average event multiplicities are studied for various hadron species. We demonstrate that the average event multiplicity is a key variable in the study of high-energy collisions. For this purpose the non-extensive statistical approach is more than appropriate. [1-4]

(ii) The method also works well with geometry-selection of an event and correlates well with spherocity classified events. Results enable us to qualitatively define the underlying event definition beyond the CDF definition. [5]

(iii) Tsallis-thermometer has also presented its success by determining the formation time of heavy flavour hadrons relative to light ones [6]

In this contribution a comprehensive summary on the power of Tsallis-thermometer will be presented in the liu of the results from the above studies.

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Category

Theory

Collaboration (if applicable)

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